

## **REMARKS**

Claims 1-8 are pending in the application. Claims 1-8 stand rejected. Specifically, Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. This rejection is based on the recitation in Claim 1 of a "petroleum based asphalt binder". The Examiner states that no support for this limitation can be found in the specification. Applicant respectfully traverses.

Applicant's specification is replete with references to asphalt and asphalt binder. Bitumen is a term that includes both coal and petroleum based materials. Asphalt is considered only petroleum based bitumen. This terminology is common convention to those skilled in the art. Thus, petroleum based asphalt is a totally included subset of the broader set of bitumen. In essence, Applicant's reference in Claim 1 to "petroleum based asphalt binder" is redundant since asphalt binders are by definition "petroleum based". Applicant's amendment of the claim to include this redundant language was necessitated by the Examiner's citation of a clearly coal based bitumen reference, i.e. the Maier patent. Thus, the addition of the term "petroleum based" to "asphalt binder" in Claim 1 is not new matter and should not be rejected by the Examiner under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Claims 1-2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maier. The Examiner states that Applicant's claim 1 is obvious in light of the teaching of Maier since it teaches a paved surface having 12% natural sand and

bitumen binder. Applicant respectfully traverses. The teaching found in Maier would not make Applicant's invention obvious since Maier does not teach bitumen binders in general, but instead teaches a very specific type of bitumen binder, i.e. a binder with a high percentage of coal based material. Even more specifically, Maier defines what he means by 'hard bitumen' employed in his invention and defines the types and percentages of those coal based material additives that are to be combined with the hard bitumen to arrive at Maier's invention. Applicant would direct the Examiner's attention to page 1, column 2, lines 66-93 of the Maier patent. Applicant's invention, on the other hand, employs only petroleum based asphalt as the binder. Applicant has amended the preamble to claim 1 to exclude coal based material in the present invention by substituting the phrase "consisting of" for the term "comprising".

The Examiner states that Maier is silent as to stability and fatigue levels of the pavement. This is not true. On page 1, column 1, beginning at line 77, Maier states that his "invention is based on the problem of providing a material for use in making road surfaces and the like which is both easily laid and also has a high resistance to deformation and a high degree of resistance to wear and tear." Maier's approach to addressing these problems is different than Applicant's approach. Maier's approach and invention involves modifying the binder through the use of coal based products in the binder. Applicant's approach and invention involve no use of coal based products in the petroleum based asphalt binder.

The Examiner further states that Maier is silent as to the binder being petroleum based. This statement is untrue since Maier's binder clearly contains

coal based bitumen and therefore is not petroleum based. Maier is quite clear that the binder is at least partially coal based. Applicant would direct the Examiner's attention to page 1, column 1 of the Maier patent beginning at line 83 where the bituminous material used by Maier is described as a mixture of hard bitumen (as defined two paragraphs earlier in the patent) and an additive that is between 10% and 33 1/3% of the mixture. The additive is clearly coal based since it contains chemical constituents that are not found in petroleum based asphalt, but are found only in coal based bitumen. The chemical constituents of the additive are by weight 40-50% tar oils, 2-5% naphthalene, 2-5% anthracene, 1-2% phenols, 3-8% polyamines, and the remainder pitch or tar. Each of these chemicals is a constituent of coal based bitumen. Petroleum based asphalt does not contain these constituents in any appreciable amount.

The Examiner states that regarding claim 2, that the binder of Maier teaches use of polyamine and Applicant teaches use of polyamide, both of which are polymers. Applicant has amended Claim 2 to specify that the polymer employed in the present invention is a polymer that is traditionally used to modify an asphalt binder for use in paving surfaces. Polyamines are not polymers that are traditionally used to modify an asphalt binder for use in paving surfaces whereas polyamides are known in the art to be traditionally so used. The Examiner further states that "polyamide contains polyamines. This statement is erroneous.

Applicant previously provided the Examiner with information about polyamides and polyamines from Wikipedia, the free online encyclopedia. Applicant is attaching further information from Wikipedia about amides and amines which

explain more fully the differences between these two types of compounds. Specifically, amides are generally nitrogen based materials whereby one or more of the ammonia hydrogen atoms are replaced with other alkyl groups. The exception is amide formation where the replacement is not an alkyl group but is instead a carbonyl group. Applicant would direct the Examiner's attention to the first paragraph of the enclosed Wikipedia reprint on Amine which states "Amides and amines have different structures and properties, so the distinction is chemically important." Obviously, polymers created from these two different types of compounds would likewise be different from each other since it is clear that polyamides have a carbonyl group attached whereas polyamines do not.

With regard to Applicant's Claim 6, the Examiner states that the layer taught by Maier is inherently substantially impermeable because the composition is substantially similar to applicants. As previously stated, Applicant's binder is petroleum based whereas the binder employed by Maier contains a substantial proportion of coal based bitumen. Thus the compositions used by Maier and by Applicant are not substantially similar. Since the compositions used by Maier and by Applicant are not substantially similar, it does not follow that Applicant's composition would be inherently impermeable simply because Maier's composition might exhibit that property.

Also, just because two compositions are impermeable, doesn't mean that they have similar compositions. A good example of this would be an impermeable plastic liner such as polyethylene. Both the polyethylene liner and Applicant's composition are moisture impermeable, but it would be problematic trying to pave

over the plastic liner with asphalt. Such an attempt to pave over the plastic liner would undoubtedly result in the asphalt pavement delaminating from the plastic liner, creating a slip plane. These plastic materials are used under concrete, not asphalt, to prevent moisture permeation.

Claims 3-6 are rejected under 35 U.S.C 103(a) as being unpatentable over Maier in view of Cramwinckel et al. Cramwinckel et al. teaches a bitumen binder composition that is impervious to water. Although both the Cramwinckel et al. composition and Applicant's composition are substantially impermeable, they are not similar in composition. The water impermeable asphaltic mastic of Cramwinckel et al. also employs bitumen derived from mineral oil and mixtures thereof with bitumen derived from coal-tar, not petroleum based asphalt. Applicant would call the Examiner's attention to column 1 beginning at line 13 of the Cramwinckel et al. patent. The term "asphaltic" employed in the Cramwinckel et al. patent should not be confused as implying that the material used in that liner is petroleum based or "asphalt" since the Cramwinckel et al. liner is clearly not petroleum based asphalt.

Together, the teachings of Maier and Cramwinckel et al., both of which clearly employ a substantial proportion of coal based bitumen, do not teach or make obvious Applicant's petroleum based asphalt binder.

The Examiner quotes a statement made in Cramwinckel et al. (column 2, lines 63-68) that the bitumen binder can be prepared from any suitable material. However, this general statement in the Cramwinckel, et al. patent is in direct conflict with the more specific descriptions found elsewhere in that patent as to the chemical composition of that invention and with the more specific definitions

provided in that patent. Cramwinckel, et al. specifically defines what is meant in that patent by the term "bitumen" as being "bitumen derived from mineral oil and mixtures thereof with bitumen derived from coal-tar". (See column 1, beginning at line 13). Thus, it is inappropriate to quote the general statement of Cramwinckel et al. regarding coal tar based bitumen in support of the proposition that this statement makes Applicant's petroleum based asphalt obvious.

Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maier in view of Malloy et al. Applicant's previously presented arguments against Maier are included herein by reference.

The Examiner states that Applicant has failed to show that Maier does not possess the properties as claimed by Applicant. The Examiner states that Applicant has not offered any substantive reasoning as to why Maier would not possess similar characteristics. Applicant's invention employs only petroleum based asphalt binder and Maier teaches a binder that is a mixture with a high proportion of coal-based bitumen. Because these compositions are chemically different, it follows that the two compositions do not possess the same properties. More importantly, Applicant's invention is not made obvious by the teaching found in Maier.

The Examiner states that Applicant's claims are open ended since they employ the term "comprising". Applicant has amended Claim 1 to employ the closed set terminology "consisting of" to limit the mixture to aggregate and a petroleum based asphalt binder. Claims 2-8 which are dependent on Claim 1 also are so limited.

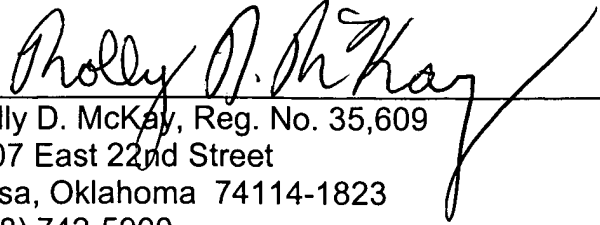
The Examiner implies that Applicant's acknowledgement of the statement in column 2 beginning at line 64 of the Cramwinckel et al. reference that the asphaltic mastic of the Cramwinckel et al. invention "can be prepared from any suitable bitumen, for example from the type of bitumen used for road construction" would therefore be an admission that the reverse proposition is also true, i.e. that a road builder would look to the Cramwinckel et al. reference and liner for application to road building. Applicant does not admit this reverse proposition since the materials used by Cramwinckel et al. relate to coal based bitumen, not the petroleum based asphalt which is the subject of Applicant's invention and the liner of Cramwinckel et al. is for a different purpose and would not necessarily have the characteristics or physical and chemical compatibility with the other constituents and layers of a road.

In summary, the Examiner has rejected all of the claims based on the same patents previously cited. Applicant has presented arguments against the use of the Maier patent and the Cramwinckel et al. patent against Applicant's invention since both of these patents clearly teach use of coal based bitumen and Applicant's invention uses only petroleum based asphalt binder. Applicant has amended independent claim 1 to employ the closed set phrase "consisting of" and has amended claim 2 to specify that the polymer modified asphalt binder is modified with a polymer that is traditionally so used.

Applicant believes that all of the claims are now allowable and respectfully requests the allowance of same.

The Commissioner is hereby authorized to charge any additional fees to the deposit account of the undersigned, No. 13-0470.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Molly D. McKay", is written over a horizontal line.

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Enclosures: Petition for 3 month extension of time  
Check for \$1,050.00 for 3 month extension of time fee  
Amended claims  
Literature on amide and amine printed from Wikipedia

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